ArchiTEXTURAL Regionalism

An Honors Thesis (HONR 499)

By

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Abstract

As Kenneth Frampton so clearly notes in his writings, the architecture of 'universal design' reflects a willful lack of acknowledgement of cultural and geographic context.

From travel to two regions of the world during field studies through the College of Architecture and Planning (CAP), I have developed a framework for use in the United States context to design for current issues and problems in a way that can yield a more place-based architecture. Travel to Europe and South America has exposed me to how designers have successfully maintained a sense of place in architecture through the use of local materials and skilled labor of the region. New design needs to recognize the successes of such past examples, while considering the needs of the present. As designers become more aware of the environmental impact their designs can have, it is necessary to move into a period of design that is sensitive to the environmental issues as well as cultural needs. Outlined in this paper are designs that have been essential to my understanding of architecture, people who have helped me understand regional architecture, and information on environmental factors that need to be considered when designing for the twenty-first century.

Acknowledgements

I would like to thank Robert J. Koester, AIA LEED AP, for guidance as my advisor on this project. Not only has his help been fundamentally influential in the completion of this thesis, but his leadership in other courses has directly benefited my growth as a student and designer.

I would also like to thank those professors in the College of Architecture and Planning who made the Field Study experiences possible and have contributed to my understanding of design.

ArchiTEXTURAL Regionalism

Archi-textural regionalism seeks to highlight the need for students to design for cultural, environmental, and geographic factors. Regionalism refers to the way a design "upholds the individual and local architectonic features against more universal and abstract ones" (Frampton 5). Kenneth Frampton, prominent architectural critic, writes that "the fundamental strategy of Critical Regionalism is to mediate the impact of universal civilization with elements derived indirectly from the peculiarities of a particular place" (Eggener, 2). Unique designs throughout the world adhere to the idea of regionalism in design, which is an acquirable goal for future design in America.

An isolated education hinders students from expanding design solutions that are successful in solving issues pertaining to the environment and culture. Designers around the world have created successful examples of past design resolution for issues and problems, but the twenty-first century carries a unique and ever-evolving set of additional design considerations. Exposing students to examples of past successful designs that apply culturally- and environmentally-responsive ideas is an important aspect of the learning experience. An education that promotes student understanding of these past ideas encourages additional layers of complexity in the design that respond to current issues. This understanding will help to improve the future built environment. The CapItalia Field Study and the Cap Americano Sur Field Study through the College of Architecture and Planning (CAP) helped expose me to the architecture of Europe and South America during my education at Ball State University. CapItalia enabled seventeen classmates and me to study the architecture of France, Italy, Switzerland, and Turkey over the course of a month. My desire to travel on this trip stemmed from an interest in experiencing the environmentally-and culturally-rich heritage of Europe. Visiting multiple cities

in each of these countries gave me a better understanding of historic architecture and successful contemporary buildings. Professor Tim Gray led students through fourteen different cities, to examine a variety of design solutions that were based on place. Place was defined by the culture of the area and often informed by the transportation systems that were developed in the region. Transportation between cities was largely accomplished through the high quality train or bus infrastructure. This infrastructure created significant landmarks and opportunities for distinct examples of regional design. Each city's heritage was represented through the characteristics of construction of the buildings of antiquity which enabled me to study how the design in the area had changed over the course of centuries. Professors Ana de Brea and Jonathan Spodek led the second of the field study trips which took a group of students to South America. The Cap Americano Sur field study enabled a group of ten Ball State University students to travel for four weeks through Uruguay, Argentina, Bolivia, and Peru. Each country provided insight into people and culture through the built environment. The purpose of the trip was to enable students to encounter designs in a culture that was previously unknown to them. South America is a region of the world that was largely under the radar and not thought of as an architectural destination. One aspect that stood out in all of the cities abroad was the dedication in design to creating unique, regional architecture.

Exposure to the solutions of European and South American architecture enables students to expand upon work that has already proven to solve specific problems. This understanding enables the layering of additional solutions to solve issues that weren't previously addressed. The built landscape around the world is constantly evolving, and it is important for designers to be aware of the shifting issues and problems in order to ensure successful design.

Case Study- Europe

The simplest way to observe both historic and modern examples of quality architecture in Europe is to travel and investigate how design decisions were made based on the environmental and cultural qualities of the design's context. Such investigation of successful European Architecture provides critical information about architecture that is tied to place. Historic architecture can be found throughout Europe that directly relates culture to the materials used in construction. It is important to look to Europe to see how future designs can relate to the new problems and issues that are being faced. The materials used to create older buildings, particularly during the Renaissance period, have provided the longevity necessary to compare classical examples of architecture to modern designs. Understanding the relationship between the cultural and environmental context and the resulting design provides the framework necessary to make future design decisions. Investigation of historical sites, like the Cinque Terre region of Italy, helps to clearly relate design to the area and culture which will help designers to connect new ideas to current context.

Cinque Terre, Italy is a collection of five towns that are integrated into the cliffs along the coast of the Mediterranean Sea. The area is known for vibrantly colored houses, a thriving fishing industry, and an agricultural heritage. There are no roads for cars in some of the towns, and no main transportation into the area except for a train that connects to La Spezia, a nearby town. The main mode of transportation between the towns is by boat or by foot- hiking for hours on trails that wind through the terracing of the agricultural land. In a majority of the towns, coves provide safe havens for boats and protect them from the rough seas (Image 1). This location facilitated the success of fishing communities (Image 2). Because of transportation difficulties, Cinque Terre needed to be self-dependent and ingenious in its use of resources.

Agriculture became an important supplement to the fishing industry since transportation to the area is difficult. The agricultural practice of Cinque Terre involves terracing the hillside to create flat plots of land. This terracing is necessary for the agricultural production and helped to define the architecture of the area as dwellings were cut into the hillside. The agricultural terraces were often no wider than five feet and covered with a series of trellises. The trellises were made from local trees that produced long, slender trunks. These structures were used to support the olive, lemon, and grape crops common to the area. Observing the area of Cinque Terre, it was clear to see the reasoning behind the design decisions.

Similar to Cinque Terre, Vatican City used local materials in its construction. Instead of using wood as in Cinque Terre, the availability of marble and other stones comprised the major material elements in design. The stone was used for interior and exterior applications in many of the buildings. Particularly evident in St. Peter's Basilica, polished stone was used to create a lavish environment that was meant to overwhelm the viewer. Adding to the grandeur of the basilica are the murals from Italian artists that emphasize the grandness and materiality of spaces. The nave of the basilica (Image 3) uses the murals to emphasize the materials of the column and the dome. Another region of Europe that emphasizes wealth of the region in design was in France at the Palace of Versailles. Many of the details in the palace complex were plated with gold and other precious metals (Image 4). The interior continued a trend found in Vatican City with ornate murals covering a majority of the walls. An emphasis on exterior spaces resulted in grand gardens that created separate areas for different types of plants.

San Gimignano created a unique type of architecture outside of Florence, Italy. The city is located on a hill in the Tuscan countryside. The town itself is walled off for protection with iconic stone towers that serve as landmarks in the town (Image 5). Reaching up above the rest of

the city, the towers signify wealth; families would build taller towers to overlook their workers. The higher the towers were built, the more workers and land the family was perceived to have under their control.

Since design is a universal language, it offers an opportunity to engage in dialogue with people living in different cultures about their built environment. From my experience, people who live in the cities we visited were willing to have conversations to give me a better understanding of place. The first of these experiences occurred in Paris where I met with Nathalie Mercier. To get to Mercier's apartment, I took the subway, the main mode of transportation during our stay in Paris. The large blue doors of Mercier's apartment building served as a wayfinding element since many of the buildings looked so similar (Image 6). This conversation enabled me to understand the importance that people place on design. I was able to talk to her about the cultural differences in living spaces to grasp the importance of different elements of the city. For example, Parisian apartments are typically much smaller than American apartments. The kitchen is often one of the smallest areas of the apartment, with tenants needing to provide their own appliances. These design differences meant that a central courtyard was created on nearly every block. One large door on the street protected the smaller community of the apartments that made up the city block. The conversation with Mercier allowed me to understand what it meant to live in Paris.

Another influential experience in France was a conversation I had with a man in Avignon. Home to an old monastery, Avignon is a historic walled city in southern France. One of the iconic sites of the city was an old bridge that led to the monastery. The man sat on a bench opposite another BSU student while the group was sketching the iconic bridge. While waiting for this student to finish, I began speaking with the man (Image 7). The conversation

ended with each of us sharing our purposes for visiting the area. He told me that the old city gave him a relaxing place to read his book. He had driven half an hour to sit and enjoy the view on this particular afternoon. Being retired, he spent multiple days a week sitting in this area overlooking the walled city. I told him that I was with a group of Architecture students from America. He immediately saw the significance of visiting the site and explained to me how important it was to see a group of students learning from the historic building that he regularly visited. This experience showed me the power of how architecture can give rise to emotion within the viewer. People were seeking out this area both to study the architecture of the city and to spend time relaxing. Frampton's idea of place and regionalism was evident during the time in Avignon.

Another city the CapItalia group visited was Vicenza, Italy. While in Vicenza, the group met with the architectural firm of Traverso-Vighy. Located in the yard of a house, the studio was noticeably different architecturally than the surrounding buildings. Giovanni Traverso and Paola Vighy opened their studio to the CapItalia group for a tour and presentation. After a short tour of the studio, the two principal architects at the firm gave a brief presentation of the design of the studio building and the overall focus of the firm (Image 8). The material choices for the studio building were based upon local availability and the skilled workers who could create and install the elements. After listening to this presentation, it became clear that regional architecture was important in their designs. Some of the main elements like the glulam structure were prefabricated by local workers and brought to the site for installation. Other elements like the steel cladding for the exterior walls and roof was fabricated and installed on site by a skilled local artisan. Another of the main considerations in the design of the building was daylighting. Their studio form was designed to achieve daylighting of all spaces during the winter (Image 9).

They looked extensively at the use of light in their spaces. From interior LED lights (Image 10) to the overall design of the building, one of the main design requirements was the quality of light in the spaces. Image 11 illustrates how the lower level was treated on the site to allow for the maximum penetration of daylight into all spaces of the building. The result was a modern building that didn't "fit into" its residential neighborhood, which caused some of the neighbors to oppose the project even though the project was built. This opposition was surprising since the building relates more effectively to the context with the use of the skilled artisans and materials of the region. People were opposing the construction of a new building that would actually perform better than the traditional styles simply because they didn't want a change in their visual environment.

Case Study- South America

The architecture of South America provided a necessary comparison to the European architecture that I experienced. Ancient South American civilizations like the Incans and Mayans produced impressive designs, but more recent architectural designers have been overshadowed by their European counterparts. The increased attention also could be attributed to the difference in economic wealth represented in South American cities compared to European cities. Also, European designers are more likely to be present in the media of the United States than South American architects. Experiencing the architecture and working alongside students from South America expanded my understanding of architecture and how designers need to consider the context in which they are designing. It was interesting to compare areas like Machu Picchu to the contemporary cities. Though many of the ideas of the built environment are similar to those found in Europe, South American architecture gives a different perspective as to how designers can alter design decisions to specific cultural and environmental context.

Architecture in South America differed greatly from European Architecture. Sacred architecture was the primary program type for a majority of the designed spaces in South America. The quality and details represented in the Church buildings often contrasted the vernacular represented by the surrounding residences and businesses. One of the clearest examples of the ornate details was seen in Cordoba. The entrance to a church is flanked by two large load-bearing masonry walls. The façade of the wall was then covered in ornamental columns that were necessary only for aesthetic purposes (Image 12). Other church buildings attempted to mimic the European examples. In La Plata, the large church contained columns that were painted to look like polished stone. The most significant example of South American architecture I visited was the Church of the Light by Eladio Dieste. Dieste, a prominent Uruguayan architect, used this church in Atlántida to explore the potentials of regional architecture. Travel to the site of the church took students away from the economic center of the city and into a poorer region of Uruguay. During the hour long trip, the high rise buildings of the city gave way to the brick and concrete shanty communities. Surprisingly, an example of influential design, located among these poorly built structures, was a complex brick structure- the Church of the Light. "Dieste was able to make such a virtue of a limited budget. Here is one of the great modern places of prayer realized magnificently when money was hard to come by and where few would have expected a masterpiece" (Glancey). Design is thought to be absent from poorer communities. Dieste challenged this notion and created a landmark in a town that otherwise would not attract a group of design students from Ball State University. Arriving at the church, the bell tower commanded immediate attention. The spiraling screen of bricks that encased a spiral staircase elegantly held the bells which signal the beginning of an event at the church (Image 13). We explored the exterior of the church by walking around the site. The

undulating walls (Image 14) created a unique exterior that was intriguing and inviting. The form of the building draws viewers from the exterior to the interior since the church looked so different from the surrounding buildings. It was obvious that something special was happening inside of the building, and the use of the stained glass and lack of exterior glazing necessitated entry to see what was occurring on the interior. Similar to the Traverso-Vighy Studio in Italy, Dieste focused on the quality of the light on the interior of the building. Stained glass windows enabled light to wash over the brick walls (Image 15).

La Paz and Buenos Aires each drew their architectural forms from the surrounding region. La Paz is a city located in the mountains of Bolivia. The city is situated in a valley between the mountains, making walking difficult. The street in this city was vitally important since space near the center of the city was hard to come by. Buenos Aires is a city located on a river, with a successful port. A man-made extension into the river created more developable land nearer to the city's center. This Puerto Madero neighborhood contains designs by famous European designers like Norman Foster. Much of this area seemed vacant and placeless when I visited during the summer of 2015. An emphasis in this area was to use open public spaces as a typical European plaza, but this contrasted with the successful areas I saw people using along the canal. While speaking with Professor Ana De Brea, a resident of Buenos Aires, I learned that this new neighborhood does contain many vacant buildings. Even though these buildings are completed, no tenants have moved in due to the high rent. Looking at the slums on the other side of the city, I found it hard to believe that these nice, new buildings were unused. The sleek new buildings contrasted the brick and concrete masonry unity (CMU) construction that was visible in the slums. Contrasting the urban areas of the trip was a visit to the ruins of Machu Picchu. This visit showed how master craftsmen were able to create buildings by individually carving

stones on the top of a mountain (Image 16). Orientation of the dwellings maximized the number of interior spaces that would receive light from the sun. This example showed how the ancient civilization of the area was able to create designs based solely on the surrounding materials and orientation to the sun. The resulting sense of place was absent from the urban architecture in La Paz and Buenos Aires.

Working alongside students who are studying in a design field gave me an enhanced perspective of how to design for a different culture and place. During the Cap Americano Sur trip, the group travelled to Cordoba to explore the architecture of another large city in Argentina and to work on a project with students at the University of Argentina at Cordoba. The plan for the collaboration was to design and build a project in small teams consisting of students from America and Argentina. This would effectively give the students the opportunity to learn what the design considerations and cultural response were for the given project. The American Students late arrival meant the design portion of the project had been completed, but we were able to carry out the build portion of the event with the students. On the first day the students designed the project and had cut sheets sent to a wood fabricator so that the specified pieces would be prepared for the build day. A local business volunteered their services to the school to fabricate the wood-sheathing pieces that the students designed. In talking to the students, we learned that this was viewed as reciprocity for the free education that is available in Argentina. Important to the group I worked with was the need for the design to be assembled without the use of any tools. To accomplish this goal, they created a design that didn't require any fasteners, making it simple to assemble for any consumer (Image 17). Their design intent was to create a piece of furniture that was simultaneously a bench, table, and display shelf for models and boards. The simple, triangular design could be aggregated infinitely in one direction to create a

field of work and presentation stations. Another reason for the simple, hardware free approach was so that any person could assemble the unit easily. The review of the work was completed by faculty from Cordoba and BSU; their critique reinforced the idea that there are similar ideas in design in all areas of the world (Image 18).

"Architecture can only be sustained today as a critical practice if it assumes an arrière-garde position, that is to say, one which distances itself equally from the Enlightenment myth of progress and from a reactionary, unrealistic impulse to return to the architectonic forms of the preindustrial past" (Frampton, 4). Frampton speaks here to the need to find the middle ground between universal culture and a reliance on the past. The culture of South America is not stagnant and is moving toward this universal culture. Conversations with Diego, Fran, and Cande proved that the culture in Argentina is evolving to be similar to American culture. These students, who I had never met before, could have been mistaken for American students. Common musical interests, sports, and even the need to eat gluten free foods are examples of some of the characteristics that are no longer defined by region. The conversations showed that the world is moving towards more of a universal culture and emphasized the need to maintain the integrity of place in future designs.

Principles for Future Design

The design process for a building must be guided by a series of design principles relating to people, cultures, and the environment. These different layers of complexity can enable designs to reach an effective solution that extends beyond the typical considerations. After experiencing design in both Europe and South America, design intentions were clearly based on the environmental and cultural context. Each place provided a series of requirements and

capabilities that were synthesized in the designs of the region. European designers utilized the abundance of stones such as granite and marble to create buildings that followed a set system of rules that were meant to create perfection. South American designers utilized the skilled brick craftsmen to create ornate forms that emphasized the skills and material of the region. Design objectives for new buildings in the United States need to continue the ideas represented in Europe and South America and incorporate strategies that encourage use of local materials, renewable energy and reduction of carbon emissions in building construction.

Design in the United States lacks the centuries old heritage of both Europe and South America. Design principles and ideas that are unique to the United States, like the skyscraper in Chicago, have been developed within the past 150 years. The book *Materials for Sustainable Sites* by Meg Calkins outlines some of the major design considerations that need to take place in twenty-first century design. With an emphasis on choosing materials that use resources efficiently, minimize embodied energy and carbon, and don't harm people or the environment, Calkins' book begins to speak about the decisions that now need to be considered. She points out that the shift to a nationalized system of business in material construction has caused the local skilled labor to become more expensive. In places like the Southwest where earthen construction should be common, the scarcity of skilled workers and the national nature of the building codes limit their use. A similar situation occurs in New England where dry stone construction should be commonplace (Calkins, 1). In order to rethink how we design in America it is important to recognize the solutions that have been developed over centuries in other areas of the world and the problems that these solutions address. The twenty-first century requires new solutions in order to address the new problems that result from the advance of renewable energy technology and commercial transportation. Nearly anything can be shipped across the

world in a short amount of time, with little consideration given to the environmental impact. In this way, materials used in building construction have evolved to meet the practices of the twentieth century. Shifting from skilled craftsmen to cheaper labor, nationalizing standards of construction that don't recognize regional needs, centralizing production of certain materials, and resource costs that are artificially low when considering the actual impact on pollution as an unaccounted externality have each contributed to a more placeless civilization (Calkins, 1).

Current building practices in Europe, South America, and around the world are not sensitive enough to the future global impact of the built environment (Calkins, iv). In the United States, the building sector accounts for 73.1% of electricity consumption, expends 30% of our raw materials, and produces nearly 136 million tons of waste on an annual basis (Keeler, 35). The consumption of energy and emissions of carbon continue to grow despite rising fears of the environmental and cultural impacts. Future designers need to begin making decisions based upon all aspects of design that address place, culture, and the factor that is often forgotten: the environment. Currently available technologies could reduce energy consumption in new and old buildings by 30-50% if implemented (La Roche, 7).

Carbon neutrality needs to be a design goal worldwide. The recent decision in Paris by 185 countries to create national plans to reduce carbon emissions is the first piece of international legislation to address the issue or carbon emissions (Davenport, 5). At 33%, buildings are one of the leading contributors to the accumulation of greenhouse gases. In more developed nations like the United States, the percentage of greenhouse gases that can be attributed to buildings may be as high as 43-49% (La Roche, 7). Material choices have a considerable impact on the carbon footprint of a building. Local materials that were evident in the European and South American projects mentioned previously greatly reduced the carbon

impact of those buildings. The choice to use a local material not only ensures reduced transportation and environmental costs, but also encourages the use of skilled local workers.

Concrete, wood, and metal are three of the primary materials used in building construction. Each of these materials has advantages and disadvantages, but designing regionally can lead to making the most beneficial choice. Concrete is the most commonly used construction material in the world (Calkins, 103). Concrete "is responsible for 6-8% of the global carbon footprint" (Brownell, 45). The cement that holds together the different ingredients of concrete is only 12% of the total weight, but contributes 94% of the embodied energy (Brownell, 45). Recent kiln technology is able to reduce the energy requirement for cement by nearly half with future projections to be even lower (Brownell, 45). To further reduce the embodied energy of concrete, a by-product of coal called fly ash can offset a majority of the cement needed for the production of concrete (Brownell, 46). Concrete is a thermally massive material meaning that it is able to absorb, store, and later release solar gains throughout the day. This delay is a passive strategy that can help reduce the heating or cooling loads in the building resulting in lower energy costs and better comfort of occupants (Brownell, 21, 46).

Wood is one of the more sustainable and carbon friendly materials used in building construction since it is completely renewable and recyclable (Brownell, 65). Another benefit is wood's biological content of 50% carbon. This carbon remains in the wood until it is burned or decayed, turning the stored carbon into water, energy, and carbon dioxide (Brownell, 65). The carbon storage capacity of wood enable forests and wood products to "act as significant global carbon sinks. The forests of Europe alone store twenty times the carbon dioxide emitted into the atmosphere annually" (Brownell, 65). Surprisingly, in developed countries, the amount of forest covered areas has been increasing by 3%. These gains are offset by the 9% decrease in forested

areas in developing nations (Brownell, 65). In order for a building to sequester carbon, it must have on-site carbon sinks. Trees and live plants are a logical way to create a carbon sink naturally. As for using wood as a building material, it is a logical choice. Wood has a low embodied energy through the harvesting, milling, drying, and transportation of the end product (Brownell, 66).

Metals are the some of the most energy-intensive materials used in building construction. During extraction, metal can cause erosion, biodiversity loss, and soil and groundwater contamination (Brownell, 88). The smelting and refining processes of metals require a large amount of energy. This large amount of energy does allow for a highly variable product since the liquid metal can be formed into many different shapes. One of the issues in using metal in the building envelope is the conduction abilities of metal. If metal is a major part of the building envelope, thermal bridging is a main concern. Where the concrete as a mass is able to delay energy transfer, thermal bridging speeds up the process and can lead to an increased need for heating and cooling in the building. To minimize thermal bridging, the conduction (path) between the interior and exterior components should be eliminated (Brownell, 88). Design decisions on materiality need to take into consideration the availability of regional materials and the skilled labor necessary for proper, quality construction.

Conclusion

Travel experiences to Europe and South America have revealed the necessity of creating architectural place. Learning about the related issues and problems has caused me to gain a better understanding of how to design and layer in the complexities of different design considerations. The work of Traverso-Vighy in their studio is an example of how high architectural quality can be attained by using local skilled labor and materials. The architecture

in Europe shows how the local materials and skills can be used to maintain the culture. South America creates a similar sense of regionalism through materiality, most evident through the work of Eladio Dieste in his Church of the Light. There were areas on each continent that did result in the placeless architecture of which Frampton warned. Conversations with people in both Europe and South America enhanced the understanding of the areas since I was able to learn why decisions were made and how these decisions affected the users of the designs. Studying the current state of the built environment through travel is important since this experience gives students a new way of thinking about design. In the absence of travel opportunities, It is my hope that this information would be used as a basis for students who are unable to attend the Field Studies to use this information to help with the design process.

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Image 2

Image 1. Sketch of the dock at Cinque Terre where boats are protected from the swells of the Mediterranean Sea. This sketch relates to the fishing history of the area.

Image 2 . Sketch of Cinque Terre showing the built environment growing out of the sheer cliff face.

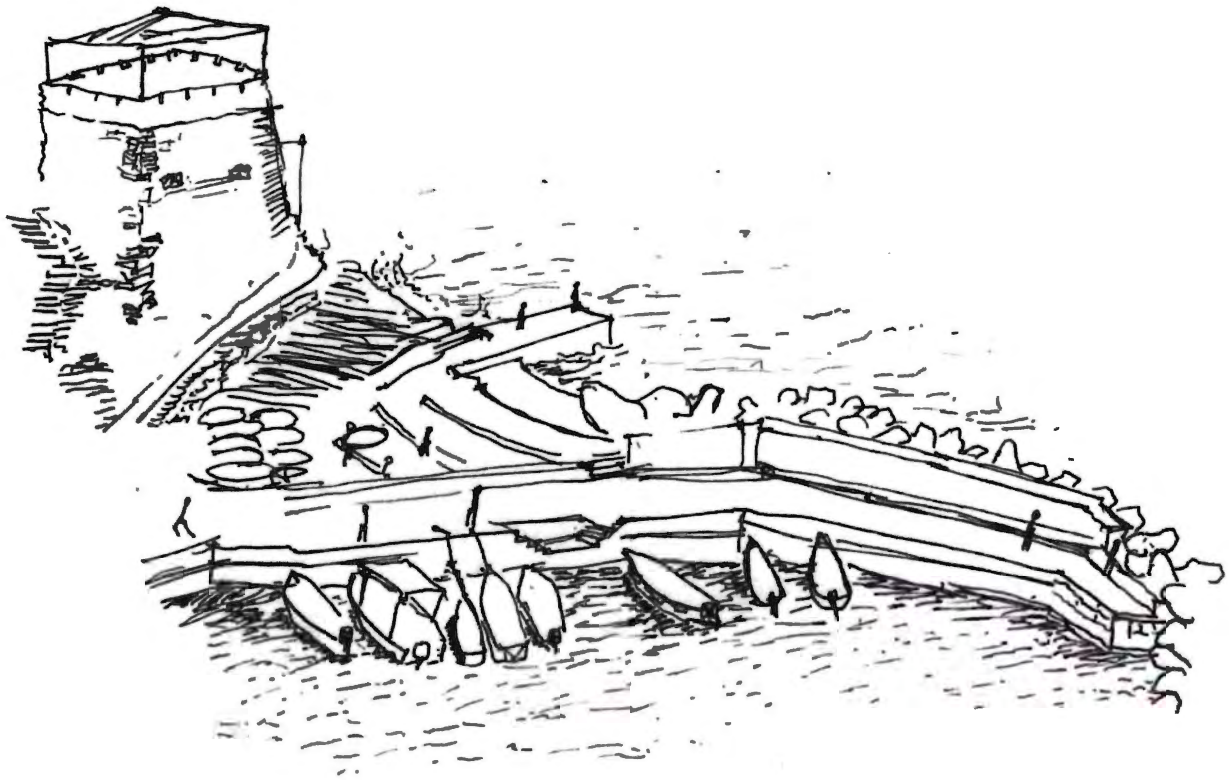

Image 1

Image 3

Image 3. Extravagant murals and carvings of St. Peter's Basilica at the Vatican.

Image 4. Golden details at Versaille's front gate.

Image 5. Towers of San Gimignano, Italy signify the wealth of the family.

Image 4

Image 5

Image 6

Image 6. Blue doors to Nathalie and Vincent Mercier's appartment in Paris.

Image 7. Conversation with a man on a bench in Avignon.

Image 8. Presentation by Traverso-Vighy at studio in Vicenza.

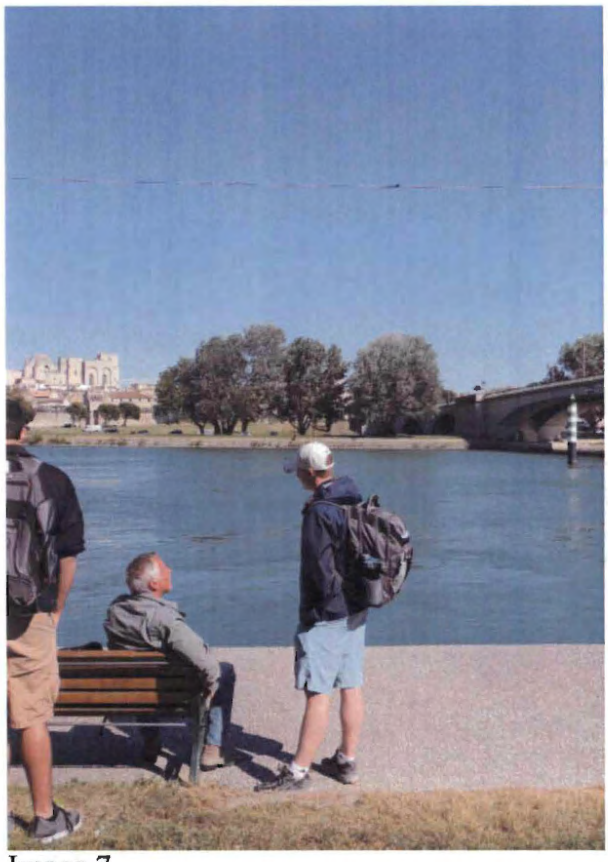

Image 7

Image 8

Image 9

Image 9. Entrance to Traverso-Vighy studio.

Image 10. Lighting detail of Traverso-Vighy studio.

Image 11. North facade of Traverso-Vighy studio that allows northern light into meeting and work areas.

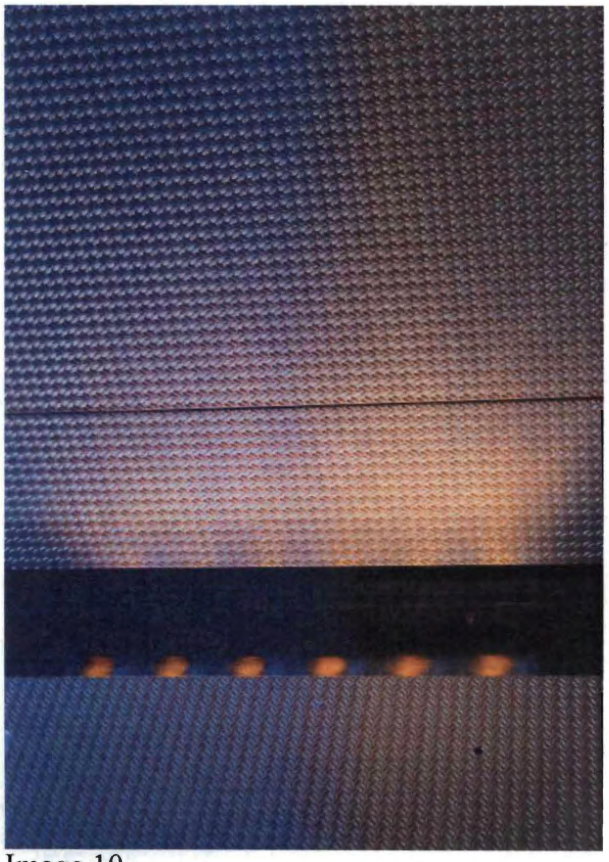

Image 10

Image 11

Image 12

Image 12. Decorative columns from a church in Cordoba.

Image 13. View looking up into the brick bell tower at Dieste's church.

Image 14. Approaching Eladio Dieste's Church of the Light in Atlantida.

Image 13

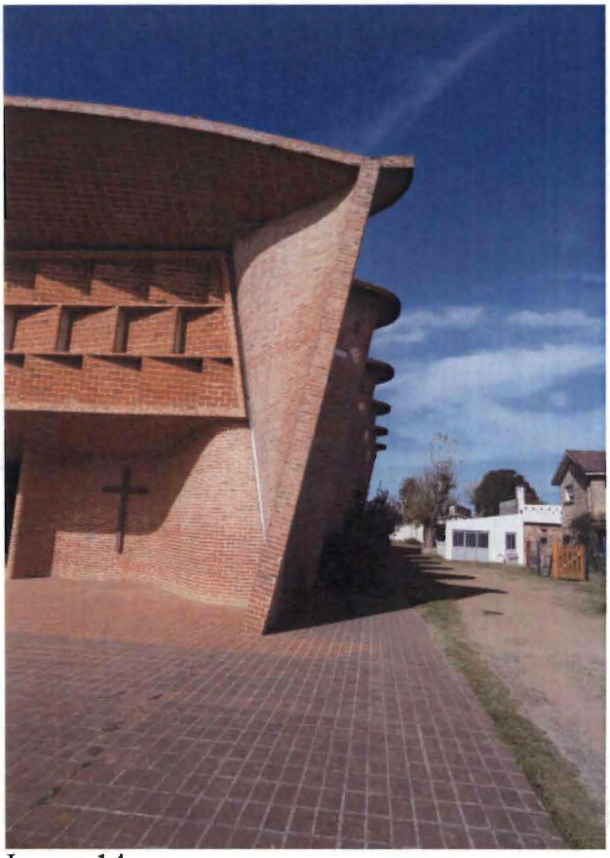

Image 14

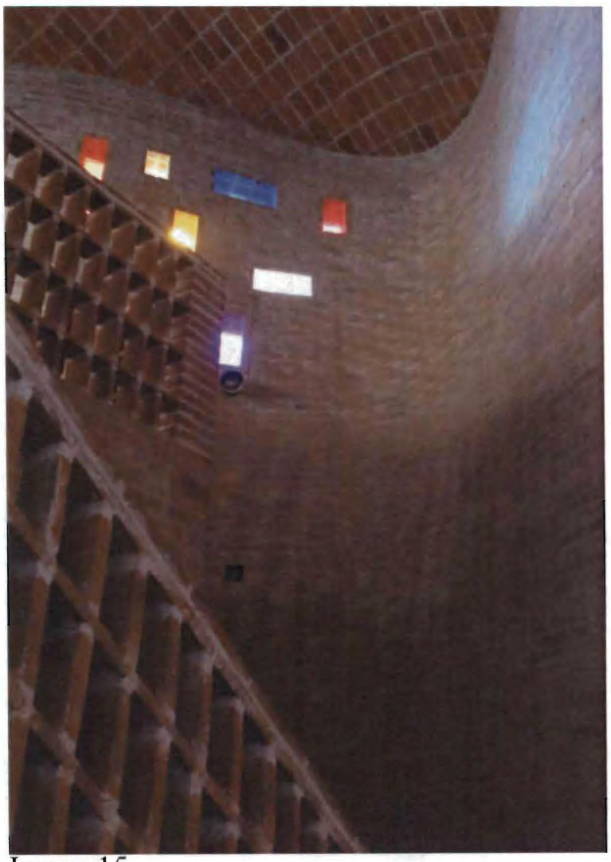

Image 15

Image 15. Stained glass windows on the interior of the Church that highlight the undulating brick.

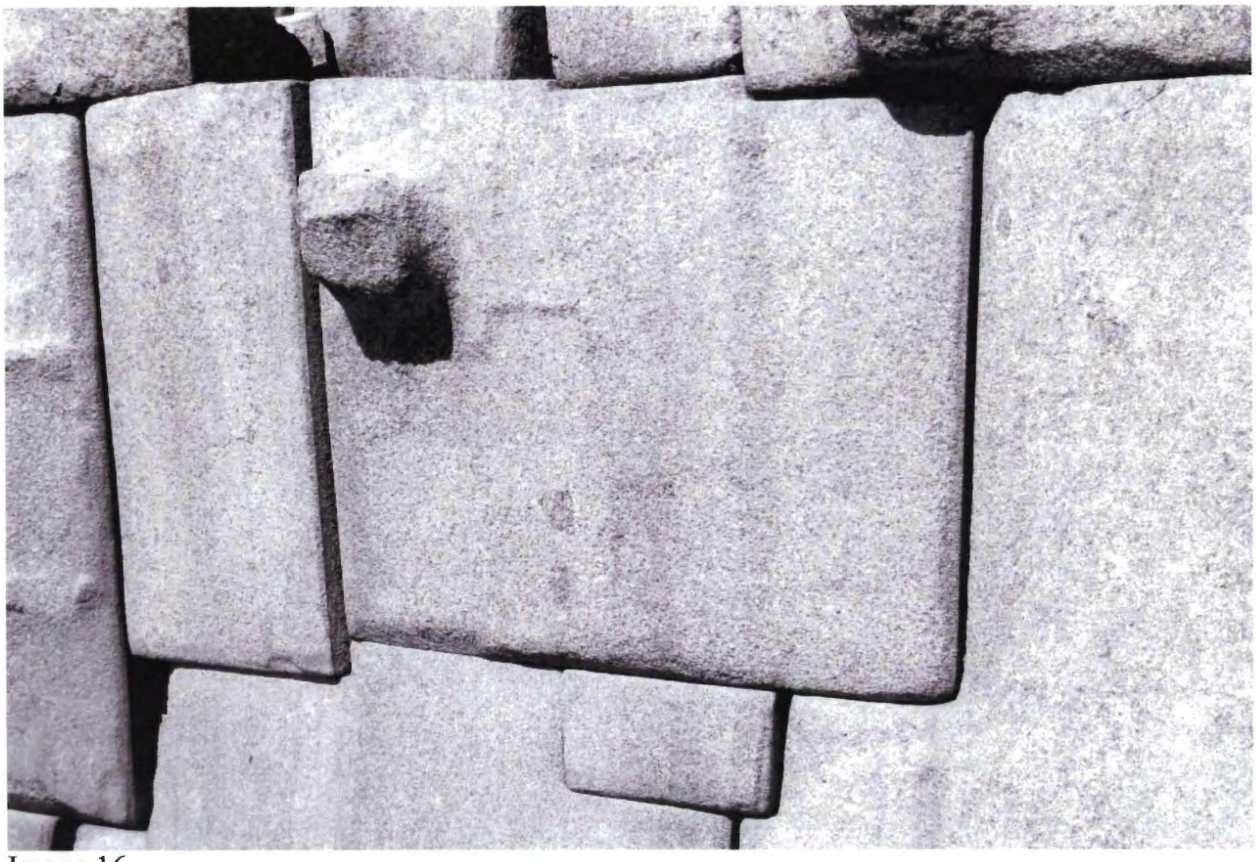

Image 16

Image 16. Carved masonry detail from Macchu Picchu.

Image 17

Image 17. Students sanding MDF in Cordoba.

Image 18

Image 18. Group photo from Cordoba following project build day.